

for its thickness, so that the old trees look top-heavy. The date palm flourishes in Honolulu, where it is quite dry, but does not do so well in the wetter parts of the island.

On studying the other trees, one is struck at once by the great preponderance of Leguminosæ, especially Cæsalpinieæ and Mimosæ. All about the town, and growing very rapidly, is the algaroba (*Prosopis juliflora*), a very graceful tree of rapid growth, with fine bipinnate leaves and sweetish yellow pods, which animals are very fond of, and which are used extensively for fodder. Add to this that the tree now forms the principal supply of fuel for Honolulu and we can realize its full value. Other leguminous trees that are planted are the monkey-pod (*Pithecolobium samang*), tamarind, various species of Bauhinia and Cathartocarpus. One species of the latter with great drooping bunches of golden yellow flowers and enormous cylindrical pods three or four feet long, rivals the Poinciana when in full flower.

Mingled with these are a great number of shrubs and trees with showy flowers or leaves, most of them more or less familiar to the stranger, either from pictures or from green-house specimens. Several species of Musa are grown, and when sheltered from the wind are most beautiful; but ordinarily the leaves are torn into rags by the wind. The tall and graceful *M. sapientum* has been largely supplanted by the much less beautiful Chinese banana, *M. Cavendishii*, which is short and stumpy in growth, but enormously prolific. The related traveller's tree (*Ravenala Madagascariensis*), is a common and striking feature of many Hawaiian gardens. Of the many showy flowering shrubs, the beautiful *Hibiscus Rosa-Sinensis* is one of the commonest, and is used extensively for hedges. One of the most striking hedges in the city, however, is the famous one at Puna Hou college, which is 500 feet long and composed of night-blooming cereus. I was not fortunate enough to see this when it was in full flower, but I saw a photograph of it when it was estimated that there were about 8000 flowers at one time.

Of the fruit trees ordinarily grown, the following may be mentioned. The mango is a very handsome tree with dense dark green foliage and masses of yellow and reddish fruit on long hanging stalks. The bread-fruit tree is common, both cultivated and wild, and is a very beautiful tree of moderate size, with leaves looking like immense fig-leaves, and the fruit like a large orange. I saw no ripe fruit, and so had not an opportunity of testing its quality. Guavas of different varieties are extremely common, both wild and cultivated, and the various fruits of the whole citrus tribe grow well. The few specimens of temperate fruits were, for the most part, much inferior to those of the United States. Of the fruits that did not strike my fancy, at least at first, was the alligator pear (*Persea gratissima*), a big green or purple pear-shaped fruit with an immense single seed. The pulp is somewhat waxy in consistence and very oily. It is eaten as a salad, and very much relished by the islanders, but the taste is acquired. The curious papaya (*Carica papaya*) is another fruit which did not appeal to my palate. Its big orange fruit, not unlike a melon in appearance when cut open, has a peculiar "squashy" flavour that suggested it having been kept a day too long.

Many showy climbers are planted, some of which, like Stephanotis, Thubergia and Allamanda are superb; but there is one that is particularly obnoxious in colour, Bougainvillea, whose magenta floral bracts are an offence to the eye, forming a cataract of raw colour. It looks, as some one observed, as if it had just come from a chemical bath.

As soon as one gets fairly away from the city, it is at once seen that all the luxuriant vegetation is strange. Along the seashore is a plain gradually rising into low hills, both almost destitute of trees, except here and there a few cocoa palms along the shore. Of the strictly littoral plants among the most conspicuous is the curious *Ipomœa pes-capra*, with deeply two-cleft leaves and purplish pink flowers. In the fertile lowlands near the sea are the principal cane and rice fields, which with taro are the staple crops. The rice is cultivated entirely by Chinese, near Honolulu; but on the sugar plantations the Japanese are largely employed. To see a Chinese laboriously transplanting little handfuls of rice into straight rows, or ploughing in the mud and water with a primitive plough drawn by a queer Chinese buffalo are sights very foreign to an American eye. Sugar cane is eminently productive in the islands, and, hitherto, has proved the main source of revenue; but now the Hawaiians are bewailing the depression caused by the free admission of sugar from other countries into the United States; as, hitherto, their pro-

duct has enjoyed practically a monopoly of the American market, having been admitted by treaty free of duty.

I made several trips up the valleys back of the city, but owing to the almost constant rain in many of them, these were not always agreeable. However, one is richly repaid by the luxuriance and variety of the vegetation. For a mile or two we pass between grass-covered hills, or hills overgrown in places with the lantana, which, introduced as an ornamental plant, has become a great pest. This plant covers some of the hills with an absolutely impassable thicket, and spreads very rapidly, so that it is a serious problem what is to be done with it. Of the common roadside plants, an orange and yellow milk-weed and the showy white *Argemone Mexicana* were the most conspicuous. As one proceeds farther, where more moisture prevails, the variety becomes larger. Thickets of Canna and a Clerodendron with double rosy-white flowers, are common, and the curious screw-pine (*Pandanus odoratissimus*) is occasionally seen. This latter is a very characteristic plant, but is much more abundant in some of the other islands. In this region some very showy species of Ipomœa are very common, among them the well-known moon-flower, *I. bona-nox*.

With the increase in moisture, as might be expected, the mosses and ferns increase in number and beauty. There are many of them of types quite different from those of the United States. One of the commonest ferns of the lower elevation in *Microlepia tenuifolia*, a very graceful fern with finely divided leaves and terminal sori. Species of Vittaria, with very long undivided leaves, are also common here.

As we ascend one of the commonest ferns is *Sadleria cyatheoides*, a very large fern, often more or less arborescent. Ascending still higher the number and variety of ferns increases rapidly, and many beautiful and interesting ferns and mosses and liverworts become common.

At about one thousand feet elevation we begin to meet with species of Cibotium, to which genus belong the largest of the tree ferns of the islands. Here, also, I met for the first time with the smallest of all the ferns I have ever seen, *Trichomanes pusillum*. This dainty little fern, one of the Hymenophyllaceæ, forms dense mats on rocks and tree-trunks, looking like a delicate moss. The full-grown frond is fan shaped, and, with its stalk, is not more than half an inch high. These tiny leaves, nevertheless, in many cases bore sporangia.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 8.—"Preliminary Account of the Nephridia and Body Cavity of the Larva of *Palæmonetes varians*." By Edgar J. Allen, B.Sc., University College, London. Communicated by Prof. W. F. R. Weldon, F.R.S.

The Green Gland, in a larva of *Palæmonetes* which is a few days old, consists of an end-sac, which communicates by means of a U-shaped tube with a very short ureter, opening at the base of the second antenna. At the time of hatching, the gland consists of a solid mass of cells, without a lumen. In later stages the tube of the gland enlarges to form the bladder. The enlarged bladders of the two sides subsequently meet and fuse in the middle dorsal line, forming the nephroperitoneal sac described by Weldon and Marchal.

The Shell Gland is found in late embryos and young larvae of *Palæmonetes*. It consists of a short renal tube, with a considerable lumen, which communicates internally with an end-sac, and opens externally at the base of the second maxilla.

Sections through the anterior region of the thorax of *Palæmonetes* show that the body cavity may be divided into four regions: a dorsal sac, surrounded by a definite epithelium, in which the cephalic aorta lies, but which does not itself contain blood; a central cavity, containing liver, intestine, and nerve-cord; two lateral cavities, containing the proximal ends of the shell glands; and fourthly, the cavities of the limbs, which contain the distal ends of the same organs.

In late embryos of *Palæmonetes* solid masses of cells lie upon either side of the cephalic aorta. The dorsal sac is formed by the hollowing out of these masses of cells. Two lateral cavities are thus formed, which are separated by the aorta. The protoplasm of the cells lining these cavities, which is at first gathered into masses around the nuclei, then spreads out into a thin sheet, drawing away from the lower portion of the aorta, and causing the two lateral cavities to unite ventrally, and so form a single sac.

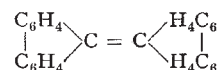
In the posterior region of the thorax the central and lateral cavities are similar to those of the anterior region, whilst dorsal to them the pericardial chamber lies. This chamber is separated from the central body cavity by the pericardial septum. The genital organs are situated immediately below the front end of this septum.

A comparison with the body cavity of *Peripatus* suggests the following relations. In the anterior region of the thorax of *Pulemonetes* the dorsal sac is homologous with the dorsal portions of the mesoblastic somites of *Peripatus*, and its cavity is a true coelom. The central and lateral cavities, together with the cavities of the legs, represent the pseudocoel. In the posterior region of the thorax the cavities are all pseudocoelomic, and agree with those of the adult *Peripatus*.

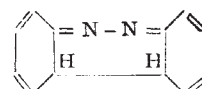
December 15.—“Preliminary Note on the Relation of the Ungual Corium to the Periosteum of the Ungual Phalanx.” By F. A. Dixey, M.A., M.D., Fellow of Wadham College, Oxford. Communicated by E. A. Schäfer, F.R.S.

Chemical Society, December 1.—Prof. A. Crum Brown, President, in the chair.—The following papers were read:—The isolation of two predicted hydrates of nitric acid, by S. U. Pickering. The author announces the isolation of two crystalline hydrates of nitric acid: the monohydrate and the trihydrate, melting at 36.8° and -18.2° degrees respectively. In the case of either the melting-point is lowered by the addition of acid or water. The existence of these compounds was foreseen from an examination of the curves plotted from Bertholet and Thomsen's heat of dissolution values. This result is an important confirmation of the author's views.—Anhydrous oxalic acid, by W. W. Fisher. The best method of obtaining crystallized anhydrous oxalic acid is by allowing the hydrated acid to remain in contact with concentrated sulphuric acid for some months in a sealed glass tube. Oxalic acid is soluble in about 30 parts of cold sulphuric acid; the anhydrous acid dissolves with absorption of heat, whilst the reverse is the case with the hydrated acid. Anhydrous oxalic acid may be crystallized from nitric acid of sp. gr. 1.5. Oxalic acid may be completely dehydrated in a vacuum at 60° ; the anhydrous acid is soluble in ethyl oxalate or glacial acetic acid, and separates from these solvents in a powdery form.—The production of orcinol and other condensation products from dehydracetic “acid,” by N. Collie and W. S. Myers. The authors have obtained orcinol by the action of barium hydrate on dehydracetic “acid” or dimethylpyrone; on boiling a mixture of syrupy caustic soda and dehydracetic “acid,” a true carboxylic acid is first produced, and, losing carbonic anhydride, yields orcinol. Among the products of the interaction of barium hydrate and diacetylacetone bright yellow needles melting at $180-181^\circ$ are found; these probably consist of a naphthalene derivative $C_{11}H_{14}O_3$. Amido-dehydracetic “acid,” obtained in long needles melting at $192-196^\circ$, by the action of strong ammonium hydrate on dehydracetic “acid,” readily yields dehydracetic “acid,” on acid or alkaline hydrolysis.—Observations on the origin of colour and on fluorescence, by W. N. Hartley. It cannot be stated in general terms that colour is due to special methods of atomic arrangement; the statement may, however, be applied in a restricted sense to certain organic compounds, especially to those included in the class to which organic dye-stuffs belong. It is pointed out that all open chain hydrocarbons exert a continuous absorption, the extent of which depends on the number of carbon atoms in the molecule. The condition of strain and instability existing in many coloured substances has been remarked by Armstrong; the author points out that all organic colouring matters are endothermic compounds, and considers this to be the physical cause of what Armstrong terms “reactivity” or “high potential.” It is shown that anthracene is not colourless, but has a true greenish-yellow colour in addition to its fluorescence. A number of experiments on fluorescence are detailed, and the following conclusions drawn from them:—(1) Alcoholic solutions of quinine exhibit a beautiful, bright violet fluorescence. (2) Hydrochloric acid is not fluorescent. (3 and 4) Quinine hydrochloride and chloroform are feebly fluorescent, but without distinct colour. (5) Both hydrochloric acid and chloroform can extinguish those rays which are the cause of fluorescence in quinine. (6) Some alkaloids may be recognized by the degree and colour of their fluorescence. (7) Normal alcohols of the ethylic series and the fatty acids are fluorescent. (8) Glycerol has a violet fluorescence. (9) Benzene has a pale blue fluorescence, azobenzene a greenish-blue. (10) Rock crystal has a

pale bluish-violet fluorescence, flint glass a strong blue, and crown glass a very brilliant blue fluorescence. (11) Substances which are not fluorescent in strong solutions may become so on dilution, particularly if they exert a very powerful absorption of the ultra-violet or invisible spectrum.—The origin of colour, v. coloured hydrocarbons and fluorescence: a reply to Prof. Hartley's observations on the origin of colour and of fluorescence, by H. E. Armstrong. If attention be paid to vi-bly-coloured organic substances, it is a most remarkable fact that in those cases in which the “constitution” is fairly well established coloured substances are found to be all of one type. The author starts from this basis to inquire whether all coloured organic substances are not similar in type. Hartley's remark that all organic colouring matters are endothermic compounds has little importance in the present connection, inasmuch as the converse does not hold. The author contends that before admitting the fluorescence of many substances, e.g. alcohol and its homologues, every precaution must be taken to ensure their purity; instances in which easy explanation of the fluorescence of certain substances is possible are given. Hartley's observation that anthracene is coloured strongly confirms the author's hypothesis. Anthracene is fluorescent, and may be represented by a quinonoid formula, whilst its isomeric phenanthrene, which cannot be so represented, is colourless and non-fluorescent. Furthermore, whilst intense colour is produced by “weighting” what the author terms the “quinonoid radicles” of anthracene by replacing the central hydrogen atoms by a halogen, no such effect attends the similar treatment of phenanthrene, dibromophenanthrene being colourless like the hydrocarbon. And yet anthraquinone and phenanthraquinone are coloured yellow and deep orange respectively. Reference is made to other coloured hydrocarbons, viz. carotin and the red hydrocarbon, $C_{26}H_{16}$, recently investigated by Graebe. The formula assigned to the latter by Graebe—

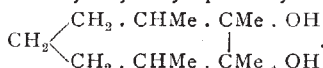


—is an improbable one; such a substance would be colourless. The author gives a possible constitution, and, for the present, proposes to call the compound “erythrophene.” The yellow hydrocarbon, $C_{26}H_{16}$, obtained together with this, is possibly a diphenylated anthracene, and may be termed “xanthophene.” The “quinonoid radicles” in both hydrocarbons are heavily “weighted,” hence their strong colour. With reference to Hartley's statement that a very little shifting of the region of absorption determines the presence or absence of colour in a compound, it is contended that this shifting may be due to a special character of structure. The author then explains his views as to the manner in which the “quinonoid mechanism” conditions colour. He suggests that in quinonoid compounds there are two “colour centres” corresponding to and expressed by the symbol $\bigcirc$ in formulæ such as he has used in representing coloured substances. These centres co-operate in producing colour through interaction of the light waves which traverse them. Substances in which there are no such co-operating centres may absorb generally and selectively in “ultra” or “infra” regions of the spectrum, but without exhibiting “visible colour.”—The origin of colour, vi. azobenzene, by H. E. Armstrong. Azobenzene, a highly-coloured substance, is generally represented as Ph.N:N.Ph , a formula in discord with the author's hypothesis explained in the preceding paper. Moreover, the formulæ usually attributed to the colourless diazo-salts (Ph.N:N.Cl , for example) represent them as comparable in constitution with azobenzene. The behaviour of azobenzene towards bromine and other reagents leads the author to doubt the correctness of the conventional formula assigned to it, and to consider the following a more probable one:—



—The reduction products of dimethyldiacetylpentane, by F. S. Kipping. The author shows that dimethyldiacetylpentane, a diketone produced by the hydrolysis of ethyl dimethyldiacetyl-pimelate is converted by reduction with sodium in a moist ethereal solution into dimethyldihydroxynonane and a compound

which, judging from the manner in which it is formed, may be regarded as tetramethylidihydroxyheptamethylene.



—The products of the interaction of zinc chloride or sulphuric acid and camphor (third notice), by H. E. Armstrong and F. S. Kipping. The authors have previously shown that the crude product obtained on heating camphor with sulphuric acid or zinc chloride contains 1 : 2 : 4 acetylorthoxylene. On oxidizing the oil remaining after the separation of the latter substance, α -methylglutaric acid is formed. This acid being the characteristic oxidation product of the phorone obtained by distilling calcium camphorate, it is probable that a homologue of this phorone is present in the camphor product.—The Griess-Sandmeyer interactions and Gattermann's modification thereof, by H. E. Armstrong and W. P. Wynne. In employing the Griess-Sandmeyer methods for displacing the amido-group by halogens, the authors find that, in very many cases, much better results may be obtained by operating at relatively low temperatures instead of at the boiling point. It appears also that the Gattermann process affords a larger yield than the Sandmeyer process, only because it is carried out at a lower temperature.—Methods of observing the spectra of easily volatile metals and their salts, and of separating their spectra from those of the alkaline earths, by W. N. Hartley. Persistent flame colourations of easily volatile metals, such as lithium, potassium, rubidium, caesium, and thallium, may be obtained by heating beads of their fluosilicates, borates or silicates, on platinum wires in the Bunsen flame. If the substance to be spectroscopically examined be converted into a borate, the spectra of the alkali metals may be first observed, and on subsequently passing hydrogen chloride into the flame, the spectra of the alkaline earth metals may be rendered visible.—Manganese borate, its constitution and properties, by W. N. Hartley and H. Ramage. Manganese borate, after drying *in vacuo* over sulphuric acid has the composition $\text{MnH}_4(\text{BO}_3)_2 \cdot \text{H}_2\text{O}$. On heating at 100° it loses one molecule of water, and at a red heat two molecules more of water are lost, leaving a salt of the composition $\text{Mn}(\text{BO}_3)_2$. From the rate of loss of water with rise of temperature the existence of a number of intermediate salts is inferred. Manganese borate possesses a maximum of solubility in water at 18° , and a minimum at 80° . This is probably due to dehydration of the compound having the composition $\text{MnH}_4(\text{BO}_3)_2 \cdot \text{H}_2\text{O}$.

Anthropological Institute, December 13.—Edward B. Tylor, President, in the chair.—Mr. Arthur J. Evans read a paper on the prehistoric interments of the Bahi Rossi caves near Mentone and their relation to the Neolithic cave-burials of the Finalese. He described the recent discovery of three skeletons in the cave of Barma Grande, and showed that the character of the sepulchral rites practised, the relics found, and the racial type of the human remains agreed with the earlier discoveries made by M. Rivi re and others in the same caves. Mr. Evans, however, opposed the theories that had been put forward as to the Pal olithic date of "Mentone Man." The bones of extinct Pleistocene animals and implements of the Moustier and Magdalenian types found in the cave earth above the interments proved nothing, for the simple reason that they were interments. No remains of extinct animals had been found in actual juxtaposition with the skeletons. On the other hand the complete absence of pottery, of polished implements, and of bones of domesticated animals in this whole group of interments and the great depth at which they occurred proved that the remains belonged to a very early period. Evidence was here supplied of an earlier Neolithic s'age than any yet authenticated. Still the remains belonged to the Later Stone Age and to the days of a recent fauna. Mr. Evans compared some bone ornaments found with the so-called hammer-heads of the chambered barrows of Scandinavia and the decorative system with that found on Neolithic pottery in northern Europe. He further showed that interments of the same tall dolichocephalic race in a more advanced stage of Neolithic culture were to be found in the cave-burials of the Finale district further up the Ligurian Coast. The physical form and the character of the sepulchral rites was essentially the same. Only the skeletons were here associated with polished axes, pottery, and bones of domesticated animals. The direction from which the new civilizing influences had come was indicated by imported shell

ornaments from the southern and eastern Mediterranean; in the Mentone caves the imported shells were from the Atlantic. In conclusion Mr. Evans showed that the latter Finale interments exhibited forms of pottery and implements identical with those of the Italian terremare of the other side of the Apennines, and included ceramic shapes which seemed to be the prototypes of vessels found in the early Sikel tombs of Mycenaean age. The Italic culture here revealed fitted on not only to that of the early pile-settlements of the Po Valley and the Lake-dwellings of Switzerland, but might be traced to the Danube valley, to Thrace, and the Troad. Amongst other parallel forms owl-like idols bearing a strong resemblance to those described by Dr. Schliemann from the site of Troy had been found by Padre Morelli of Genoa in one of the Finale caves.—Dr. H. Colley March read a paper in which he sought to prove that the peculiar features of Polynesian ornament are due to a mythology which is, in the main, a symbolism of origin and descent. Thus regarded, unattractive and bewildering designs are resolved into emblems of divinity and demonstrations of lineage. He traced the evolution and defined the attributes of Tiki, explained the nature of oromatus and the meaning of unus, described the various methods of recording pedigrees, whether along a male or along a female line, and illustrated the mythical use of tapa and sinnet. He discussed, as modes of origin, totemism, gemmation, and generation, of which Polynesian examples were given, tabulated the kinship of the superior gods, set forth in full the Tane cult, especially in relation to the axe and the drum, and endeavoured, in conclusion, to account for the development of the complicated Mangaian adze.

EDINBURGH.

Royal Society, December 5.—Sir Douglas MacLagan, President, in the chair.—After an introductory address by the President, a note by Prof. Cayley, on uniform convergency of series, was read.—Prof. Tait communicated a note by Prof. P. H. Schoute, of Groningen, on the locus of a uniformly revolving line, which always passes through a point moving uniformly round a circle, and which always lies in a normal plane passing through the centre of that circle. The degree of the locus is found by an elegant and very simple method.—Dr. C. Hunter Stewart gave notice of a paper on the further development of Kjeldahl's method of organic analysis. The carbon, as well as the nitrogen, present can be determined by the same analysis in the developed method, and much smaller quantities than formerly of the substance analyzed lead to results as accurate as those previously obtained.—Prof. Tait read a note on the division of space into cubes. He gives a different, and more direct and short, solution by quaternions than that given by him some years ago.

PARIS.

Academy of Sciences, December 26.—M. d'Abbadie in the chair.—Thermal elevation under the influence of injections of soluble microbial products, by MM. Bouchard and Charrin. An elevation of temperature recalling that observed by Koch is produced in a marked degree in tuberculous patients by injections of the toxic substances secreted by the pyocyanic bacillus.—Vessels and clasmocytes of the hyaloid in the frog, by M. Ranvier.—Observations of Holmes's comet (November 6, 1892) made with the great equatorial of the Bordeaux Observatory, by MM. G. Rayet and L. Picart, report by M. Rayet.—Observations of Swift's comet (1892, I.) made with the great equatorial of the Bordeaux Observatory, by MM. G. Rayet, L. Picart and F. Courty, report by M. Rayet.—On the laws of dilatation of fluids at constant volume; coefficients of pressure, by M. E. H. Amagat.—Observations of Holmes's comet, made with the equatorial *coud * (32 cm.) of the Lyon Observatory, by M. G. Le Cadet.—New experimental researches on the personal equation in transit observations, by M. P. Stroobant.—On conjugate systems and couples of applicable surfaces, by M. A. Petot.—On infinitesimal deformation and Bianchi's associated surfaces, by M. E. Cosserat.—On contiguous surfaces relative to the hypergeometrical series with two variables, by M. Levasseur.—Test for the convergence of series, by M. A. de Saint-Germain.—Criterion of divisibility by any number, by M. Font s.—On the motion of a particle in the case of a resistance proportional to the velocity, by M. Elliott.—General form of the law of vibratory motion in an isotropic medium, by M. E. Mercadier.—Employment of springs in the measurement of explosive pressures. If errors due to the inertia of the moving parts of the indicator are to be avoided, the amplitude of the

tracing point must not exceed 1 mm. in the case of pressures used in modern firearms. This necessitates careful reading with a microscope.—On the decrease of temperature of the air with the elevation, by M. Alfred Angot. Experiments conducted on the Eiffel Tower indicate a decrease for each 100 m., between the soil and a height of 160 m., ranging from 0.6° in December to 1.46° in June. Between 160 m. and 302 m. the decrease per 100 m. ranges from 0.64° in February to 0.96° in October. At 300 m. the decrease per 100 m. is on the average 0.5° in winter, 0.6° in autumn, 0.7° in spring, and 0.8° in summer.—On the temperature of the electric arc, by M. J. Violle. From calorimetric measurements made with a portion of the arc light carbon detached from the hottest part during the passage of the current, the temperature of the arc, *i.e.* that of the volatilization of carbon, appears as 3500°, assuming the carbon to have its theoretical specific heat, 0.52, at the higher temperatures. This temperature of volatilization is constant, whatever the power employed.—Remarks on high temperatures and the vaporization of carbon, by M. Berthelot. The vapour tension of carbon is quite appreciable even below volatilization, which involves the reduction of a polymer to the monomolecular state, thus in reality representing a chemical process. Higher temperatures than that of the arc can be attained by purely chemical means, such as the explosive combustion of a mixture of oxygen and cyanogen.—On the equality of velocities of propagation of electric waves in air and along conducting fibres, verified by the example of a large metallic surface, by MM. Ed. Sarasin and L. de la Rive.—On nets of electric conductors; reciprocal properties of two branches, by M. Vaschy.—On the enfeeblement of electromagnetic oscillations with their propagation and their subsidence, by M. A. Perot.—Determination of the coefficients of self-induction by means of electrical oscillations, by M. P. Janet.—Doppler-Fizeau's method, exact and approximate formulæ, evaluation of the error involved, by H. de la Fresnaye.—Magnetic properties of oxygen at different temperatures, by M. P. Curie. A series of measurements with oxygen compressed to 5 and to 18 atmospheres respectively gave identical results at temperatures between 20° and 450°. Within this range, the volume coefficient of specific magnetization of oxygen varied inversely as the absolute temperature. The volume coefficient of magnetization of air at the ordinary pressure and at temperature *t* is given by $10^6 k_t = 2760 \times T^{-2}$, where *T* is the absolute temperature.—On the rotatory power of quartz at low temperatures, by MM. Ch. Soret and C. E. Guye.—On the fusion of carbonate of lime, by M. A. Joannis.—Ammoniacal compounds derived from ruthenium sesquichloride, by M. A. Joly.—On an iodo-sulphide of phosphorus, by M. L. Ouvrard.—Action of bismuth on hydrochloric acid, by MM. A. Dite and R. Metzner.—Action of potash and soda on the oxide of antimony, by M. H. Cormimbœuf.—Relation between the heats of formation and the temperatures of the point of reaction, by M. Maurice Prud'homme.—On the study of the chemical reactions in a liquid mass by the index of refraction, by M. C. Féry.—On a prolylamidophenol and its acetyl derivatives, by M. P. Cazeneuve.—Quantitative determination of impurities in the methylenes, by M. Er. Barillot.—Separation of micro-organisms by centrifugal force, by M. R. Lezé.—Loss of nitrogen in manures, by MM. A. Müntz and A. Ch. Girard.—Fermentation of manure, by M. A. Hébert.—Drying-up of marshes in Russia, by M. Venukoff.—Chemical conditions of the action of ferments, by M. J. Effront.—On trichophytia in man, by M. R. Sabouraud.—Evolution of the functions of the stomach, by M. J. Winter.—On the histology of the organs attached to the male apparatus in *Periplaneta orientalis*, by M. P. Blatter.—On the presence of a fossil Araliaceae and Ponderiaceae in the coarse Parisian limestone, by M. Ed. Bureau.—On a new geological map of the French and Spanish Pyrenees, by MM. Emm. de Margerie and Fr. Schrader.—Differential motion of the ocean and the atmosphere; water tides and air tides, by M. F. de Saintignon.—On the perforation of the basaltic rocks of the Gulf of Aden by shingle; formation of a Giant's Kettle, by M. Jousseau.

DIARY OF SOCIETIES.

LONDON.

THURSDAY, JANUARY 5.

ROYAL INSTITUTION, at 3.—Astronomy: Sir Robert S. Ball, F.R.S.
LONDON INSTITUTION, at 6.—Jewish Wit and Humour: The Rev. the Chief Rabbi.

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SATURDAY, JANUARY 7.

ROYAL INSTITUTION, at 3.—Astronomy: Sir Robert S. Ball, F.R.S.

SUNDAY, JANUARY 8.

SUNDAY LECTURE SOCIETY, at 4.—In Search of Pharaoh—Ancient Egypt: its Temples, Pyramids, Monuments, and Mummies (with Oxygen-hydrogen Lantern Illustrations): Whitworth Wallis.

MONDAY, JANUARY 9.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—Qualitative Analysis of Colouring Matters: A. G. Green.—The Proportion of Free Fatty Acids in Oil Cakes: Dr. B. Dyer.—Further Notes on Nitrous Oxide: W. A. Smith.
ARISTOTELIAN SOCIETY, at 8.—The Psychology of the Subconscious: A. B. two d.
LONDON INSTITUTION, at 5.—Social Pictorial Satire (Illustrated): G. du Maurier.

TUESDAY, JANUARY 10.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—A Contribution to the Ethnology of Jersey: Dr. Andrew Dunlop.—Points of Contact between Old World Myths and Customs and the Navajo Myth, entitled "The Mountain Chant": Miss A. W. Buckland.

WEDNESDAY, JANUARY 11.

GEOLOGICAL SOCIETY, at 8.—Varieties of the Highland Associated Volcanic Rocks: Miss Raisin. (Communicated by Prof. J. G. Bonney F.R.S.)—On the Petrography of the Island of Capraja: Hamilton Emmons. (Communicated by Sir Archibald Geikie, For. Sec. R.S.)

THURSDAY, JANUARY 12.

MATHEMATICAL SOCIETY, at 8.—On the Application of Clifford's Graphs to Ordinary Binary Quantities, 2nd Part, Semivariants: The President.
INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Experimental Researches on Alternate-Current Transformers: Prof. J. A. Fleming, F.R.S. (Discussion.)
LONDON INSTITUTION, at 6.—Electric Lighting (1) Generation of Electric Currents: Prof. Silvanus Thompson, F.R.S.

FRIDAY, JANUARY 13.

PHYSICAL SOCIETY, at 5.—Upon Science Teaching: F. W. Sanderson.
AMATEUR SCIENTIFIC SOCIETY, at 8.—Geology in 1892: A. M. Davies.—Recent Developments in the Metallurgy of Gold: T. K. Rose.

SATURDAY, JANUARY 14.

ROYAL BOTANIC SOCIETY, at 3.45.

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